The Facts of Biology and the theories of Evolution

by

Harry Rimmer

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HARRY RIMMER

President

RESEARCH SCIENCE BUREAU, *Incorporated*

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RESEARCH SCIENCE BUREAU, Inc.
5141 Crenshaw Boulevard
Los Angeles, Calif.

Printed in U. S. A.

From the Plant of Glendale Printers, Glendale, Calif.
Publishers of Religious Booklets

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THE FACTS OF BIOLOGY AND THE THEORIES OF EVOLUTION

"The riddle of the universe" is still unsolved! Of all the amazing and perplexing questions that have fascinated and baffled the mind of man, the problem of the origin of life is the most stubborn. Science has solved uncounted enigmas, but the simple fact of life has so far resisted every effort of the man of research, and its origin is as much a scientific mystery as it ever has been. Even the vaunted theory of organic evolution which has held sway and retarded true scientific investigation and progress for so long, never offered any explanation of the origin of life, but was content to speculate on the progress of that which was already here.

The universe teems with life. It rides on every atom of dust; it lives in every drop of moisture in nature; it throngs the very air we breathe. In the sap and juices of all plants and fruits, in the moisture that exudes from the bodies of man and beast alike, in the rain that falls from the clouds above, in the ponds of fresh water, the pool of desert alkali or the pulsing expanse of the ocean's deep; everywhere that there is moisture, life is seen. In darkness and light, in the recess of the unplumbed depths of the grimmest cavern, or the ceaseless blaze of the Sahara sun—**life** is omnipresent.

It is, of course, inevitable that science should strive to solve the problem of the nature and origin of the mysterious thing called life. Science exists only for the joy of exploring unknown paths, but after these generations, yea even centuries, of research and inquiry, the beginning and source of life is as mysterious as

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ever. Recognizing its presence here, and starting our inquiry with an acceptance of the fact of the reality of life we learn many things about it, but its nature and beginnings are shrouded in the impenetrable veil that hides all questions of origin. Paradoxically, the facts we do possess make the mystery of origin the deeper!

We know that there is never any life without antecedent life of that particular kind. Many and exhaustive experiments have established this fact beyond the shadow of question—life only comes from vital ancestry. It may be of interest here to review a series of experiments that establish this, and we shall take time for a very brief summary of results and conclusions. Because of their rapid generation and quick growth to maturity, the order of life called the "Infusoria," was used.

You are undoubtedly familiar with this kind of life. If straw, hay, dried leaves, lettuce, or any other kind of vegetation is put in water and allowed to stand long enough, the water will be found teeming with animalcules of various species and varieties. Their number is almost unlimited, and they are a favorite subject for the experimenter in biology. In the course of the observations we again defined the methods of reproduction of each of the various kinds of animalcules under observation, purely as a check control for generally accepted data. Some of these creatures reproduce by budding, some by direct cell division, and some by "spores" which might roughly be compared with eggs.

Absolute sterilization of the elements of the experiments was assured, so that there was no chance to lose the conclusion of the experiment by life from a source inherent in the technique. In one series the water was sterile, the test tube was sterile, and the straw used was also sterile. The tube was made so by boiling for two hours, after having been given an acid bath fatal to any possible life continuity. The water was sterilized by boiling two hours, and the hay used was first boiled and then baked in an electric oven. The tubes in this case were loaded mechanically in an electric oven, and thus they were kept in sterile atmosphere until sealed with a boiling seal that was also sterile. From this series of tubes we got not one single atom or speck of life of any kind or form whatever. So the conclusion is inevitable—where there is sterility of material, there is no life.

Every other experiment resulted in the production of life in teeming masses. In one series the tubes were sterile, the hay sterile, the air sterile, but the water was in a natural and unsterilized state. These tubes swarmed with life at the time of their opening, **so there was life in the water.** Another series had sterile water, sterile tubes, sterile air, but the straw used was in a natural state. The tubes when opened were heavily populated with infusoria so **there was life on the straw.** The next series had the straw, water and tubes sterile, but they were loaded in an ordinary atmosphere, and those in turn yielded myriads of living creatures, thus evidencing that there was **life in the air** as well. Take a few flakes of dust and "incubate" them and life will teem as a result. A speck of mud, a bit of decayed vegetation, a wisp of hay, a drop of moisture, or a breath of air—the seeds or spores of living matter are in or on them all. BUT WITHOUT THESE VITAL SEEDS FROM PREVIOUS ANCESTORS THE PRODUCTION OF LIFE IS AN ABSOLUTE IMPOSSIBILITY! There is no life without vital antecedents. This is perhaps a waste of your time, so well is the law established, but it brings us face to face with the hopelessness of a scientific answer to the enigma of vital origins: **for if life only comes from life, from whence did the first life come?** We certainly know nothing of its nature and origin that has been or can be established by what we may call true scientific demonstration.

Assuredly, the eager questing mind of man must continue to strive for the answer to this as to all other perplexing problems. And when the interest of the average man is aroused to the problem of the origination of life, it is but natural that he turn to physical science and say, "Where and when and how did this thing called life begin?" To this query science can only reply, "We do not know!"

In science we do not deal with origins. A science is a correlated body of absolute knowledge. When knowledge of a certain subject has been gained by observation, proved by demonstration, and refined by experience, we gather the known and proved facts of that subject and correlate them under the title of that subject and call this body of specialized knowledge the science of that subject. So then, science is knowledge gained and verified. How gained? By trained observation. This is, in truth, the only acceptable source of scientific knowledge, as observation by untrained persons is not reliable, and therefore unacceptable. The observations of the untrained more frequently lead to superstition and error than to scientific knowledge. As an instance, let us remember the traditional fable so common to rural districts, that a horse-hair left in water will eventually turn into a snake. How many times I tried that in my youth, and how many ancients there are still today who will arise and aver the truth of this belief: have they not seen these hair-like worms in the water many times? This firmly believed tradition comes from untrained observation.

I recently heard of a humorous illustration of this very point. A small boy said to his father, "Now I know where horses come from. Mr. Schultz, the blacksmith down the street, makes them." "Oh, no," his dad replied, "horses are born, not made. Just like cows, or chickens, or people." "No sir!" the lad insisted, "the blacksmith makes them. I saw him make one." The father was puzzled at the boy's insistence, and asked, "Now just what did you see? Did you see the blacksmith make a whole horse?" To which he received the amazing rejoinder, "No, I didn't see him make a whole one: but I saw him finish one up. **He was just nailing the feet on when I passed by!**" A perfect case of untrained observation.

I have talked with many adults who were as scientifically wrong as that! Some weird idea of what constituted science and scientific proof had wormed its way into an untrained and unprepared mind, and the wildest fallacies were believed to be sane and sober scientific fact. Some of the most warped and fantastic theories the mind can conceive are continually coming to light under the guise of science.

Regardless of what theory of origin we may accept, there is a common ground on which we must agree; before there was a man on the earth, the earth was here, prepared to receive him. Also, regardless of the method of creation, man is the last species to appear. So if scientific knowledge comes only through trained observation, how could there be knowledge of creation, or origin, which antedated the presence of man, the observer? So we say that science does not deal with origins. When things originated, who was there to observe, and where was this hypothetical observer trained? And by whom? What experiments verified his observations? No matter how much our theories of origin may disagree, we certainly can agree that there was no trained human observer of the process.

The question of origin is therefore either in the field of philosophy or of revelation. Philosophy, not being dependent upon either proof or fact, but being entirely speculative or theoretical, may be expected to speak upon any subject. Since the nebulous vaporings of philosophy are incapable of proof or demonstration, the scientific accuracy of a statement or theory matters nothing in the pronouncements of philosophical ideas.

On the other hand, if an intelligent and reasoning Creator is in truth responsible for the marvelous mathematical structure of the physical universe, it is only logical to suppose that He would be pleased to supply a record or an explanation of the process to whatever reasoning creatures He had been pleased to create. *This revelation of events that preceded the advent of man could owe nothing to human contribution and could not be said to be dependent upon human research or scientific study.

So when science replied that origins were not in her sphere, the questing mind of man turned to philosophy to seek what help philosophy could give. With the eager readiness to attack all problems on the purely mental plane that characterized the philosopher, the reply was quickly forthcoming.

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* See: Modern Science and the First Fundamental.

EVOLUTION!

This is the reply of philosophy to man's query, "Where, and how, did life originate?" It is not a scientific theory, it is primarily philosophical. However, when philosophy had framed the theory, science was invited to prove its truth. With great eagerness science responded and has for generations been combing the heavens and the earth for a truly scientific demonstration of this theory. But alas, for philosophy, the attempt has failed. The last twenty-four months in scientific research have not only failed to demonstrate the fact of organic evolution, but have actually produced new facts of science that render the theory literally untenable.

THERE IS A SCIENCE OF LIFE. That science is called biology, and consists of the known, proved, verified and demonstrated facts concerning life. The classification of all living things into family groups, orders, genera and species is the work of biology. Botany, zoology, ornithology and all other sciences dealing with life and living creatures are included in the general classification of biology. It is a most comprehensive science embracing all known facts regarding all known forms of life.

Certainly, if the theory of organic evolution is to find a proof in any branch of science, it must find that proof in the biological sciences. It is rather startling to learn that the farther we go into biology, and the deeper we delve into its mysteries the less probable the theory of organic evolution becomes! Until finally the well-informed research biologist repudiates the theory as scientifically untenable.

Now comes the query "On what grounds of real evidence do you state that? Can the evidence be so stated that a layman, without scientific training and vocabulary, can master the proof?"

The purpose of this study will be to answer the query.

II.

The theory of evolution may be clearly and concisely stated in scientific terms as the transmutation of species. Mutation, is development; transmutation, is evolution. Red roses, white roses, pink roses, yellow roses, or any other variety of rose that may exist, all are variants, or mutants, in the mutation of the rose. But when the rose has progressed so far in mutation that it produces some new creature **that is not a rose,** then transmutation is accomplished.

All the varieties of the chicken kind have come from a common ancestral pair. The great number of different chickens the farmer is so familiar with are all mutants, or variants, of these same creatures. Mutation has progressed in the chicken to a striking extent, but as long as they all remain chickens, we are not yet in the presence of evolution. When one of these variants gives rise to some **higher** form of life that is distinctly **not** a chicken, then we have transmutation.

It is the theory of the evolutionist that all the present forms of life the earth knows, as well as all the extinct species that have been here in past ages, came from a single primitive cell. The amoeba has been suggested as a possible starting point for transmutation, and all evolutionists agree that some protoplasm in unicellular form was earth's earliest creature. From this simple single cell came gradually all that we have recorded in the twin sciences of biology and paleontology. One low form of life produced a subsequent and higher form by transmutation, until the marvelous gamut of varieies and species and genera has been run, and the present forms of life, with which we are so familiar, arrived by evolution, we are told by the proponents of that theory.

How startling it is to the unprejudiced thinker to realize that, although the great creatures of the past ages are remembered only by their fossil bones, and countless hundreds of species and genera have perished from the face of the earth in the course of "evolution," THE ONE-CELLED ANCESTORS STILL REMAIN! And that though these amoeba and monera and rhizapods throng the earth in uncountable profusion, none of them are in course of evolution **today.** Here we have the weird spectacle of the great metazoa perishing off the face of the earth, while their single-celled ancestors persist in teeming masses. This is an anomaly, indeed, that evolution cannot explain.

When these present day protozoa, which are living creatures whose entire organisms consist of just one cell, are observed for thousands and thousands of generations, they never change one iota from what they were in the very beginning. Countless generations pass under the eye of the observer and no new species of protozoa arise, nor do metazoa result from changes in protozoan structure. Verily, the cell is a mysterious continent awaiting exploration and conquest.

There can be no question but what the cell is the basis, or unit, of life. When the mystery of life has been finally solved, the solution of the baffling enigma will come from new knowledge of the cell and its marvelous structure.

All sentient life is composed of cells. From Paramoecium, with its one single cell as its entire organic structure, to man, with twenty-six (American) trillion cells colonized to form his amazingly complex organism, life is made up of groups of cells.

For a long time morphology, the science of gross bodily structure, proved the stumbling block of biologists. Realizing that all living things were simply masses of cells, and SUPPOSING THAT ALL CELLS WERE FUNDAMENTALLY THE SAME, the biologists of a past generation concocted the theory of the Continuity of Life. This theory was that the simple protozoan forms of life passed on the same kind of life to simple metazoan forms, which in turn passed it on to simple fish forms, which in turn passed it on to simple reptiles, that the reptiles passed it on to birds, the birds passed it on to mammals, which latter animals passed the same life on to man, the climax and apex of transmutation. The continuity theory stated that all life was the same life, as it was resident in the cells, which were believed to be identical in all species.

There is a fatal flaw, however, in the basis on which the continuity theory was supposed to rest. ALL CELLS ARE NOT THE SAME. There is one kind of cells of birds, another kind of cells of fishes, another kind of cells in animals, and a totally different kind of cells in man!

The cell is a marvelous structure. During recent months the cell has been the field of many interesting and exciting explorations, and some new discoveries made therein are dramatic in the extreme. It is in this sphere of cell-differentiation that the theory of evolution has suffered its saddest collapse. No matter what relationship morphology may seem to suggest, histology clearly testifies in clarion tones to the diversity of life-substance in the various species.

It is ridiculous to refer to "similarity" as a scientific evidence of relationship. Where else in scientific circles do you find the investigator relying upon outside appearances to decide his problem? Whatever else the scientist's technique may be, it is never a process of surface indications. That "similarity of morphological structures implies relationship," is the slogan of the untutored layman, not of the scientifically trained investigator. Therefore, the question must be decided upon the evidence of histology, which is the science of the minute, the examination of the microscopic.

There is plenty of reason to say, on the grounds of morphology, if we were limited to the microscopic, that different species are composed of different life substances. All cells are **not** the same. That there is a real and demonstrable difference between the cells of a pig and a cow any diner can testify. Some people thrive on beef, but pork makes them sick. In the light of the fact that all cows and all pigs are simply cell-colonies, what consitutes the difference between meats if all cell structure is fundamentally the same, and life has been passed on in continuity from species to species? What is the difference between chicken and duck, quail and pheasant, rabbit and venison, or fish and T-bone steak, if all cells are the same?

Let us reason this through, and see that even gross bodily form shows a tremendous difference between varying cell structures in the manifold divisions of biology. For instance, Paramoecium is a slipper-shaped animalcule, having certain easily recognized food vacuoles, and moving by the activity of numerous cilia that fringe its unicellular body. But the Euglena is different in shape, the vacuoles are totally different, and it propels itself with one long cilium that protrudes from the "head" end. Others, such as the amoeba, have no cilia or means of locomotion, but progress by the method of accumulation of ectoplasm. They thrust out a portion of their bodily substance in what may be called pseudo-pods and when they have accumulated a sufficient portion of themselves in a given place, the rest of themselves simply flows into these pseudo-pods, and they have changed their location in space. This accounts for the constantly changing shape of such protozoa as amoebae.

Their habits of taking food vary as much as their methods of locomotion. Some have primitive "mouths" that open and close, and some simply surround and enclose their prey. Having no skin to hinder, they can literally incorporate the food object into their body by surrounding it on all sides and closing their substance again, entirely absorbing the foreign matter, or food particle.

Protozoan methods of reproduction vary as much as methods of locomotion and feeding. Some are "immortal" and never die, breaking their body substance up into many new individuals, with the original organism still living in all the particles, which quickly become adults of their kind, to live their brief cycle of hours and repeat the process of division. Others literally and actually die, after giving birth to progeny through spores. Some forms of microscopic life actually conjugate to rejuvenate their reproductive powers. Their methods of reproduction are complicated, even though the creatures themselves are simple.

There is an amazing host of these different microscopic creatures, and they may be distinguished by the protozoologist with the ease that the average observer can tell a horse from a cow. Even though they are all composed of just one cell, they differ in size, in shape, in methods of locomotion, in food habits and in methods of reproduction. One thing they all have in common, however, no matter how they may differ one from the other, **each separate** kind produces **always** and **only after its own kind.**

The conclusion then may well be stated in positive terms; there is a real difference in cell-structure. All cells are not the same, life differs from life, and kind from kind, in myriad forms.

It is not a scientific demonstration, however, until we have examined the very substance of the cell itself. It is in this analysis of the life basis that the question of similarity and relationship must be settled. What is the real difference between one kind of cell and another kind?

The cell has been the field of painstaking inquiry, like the atom. We used to hear our teachers say that all matter was made up of atoms, tiny bases of substances so small that they would never be isolated or observed by human endeavor. But Millikan and his cohorts got on the atom's trail, and now we see it as a **comparatively** enormous mass! It is divided up into infinitely smaller particles, and the eager pursuit continues the endeavor to divide these electrons up into their basic substance!

So with the cell. Eager searching has divided the cell up into its various component parts. We must not conceive of the cell being a small mass of homogeneous substance. It is, in fact, a heterogeneous organism. There are five major divisions in cell-structure, and in each of these major divisions the cells of one species differ from the cells of every other species.

Let us consider that phase of cell structure that has been named "CHROMOSOME." In the cells of the various species there is a varying number of these chromosomes, ranging from two in some simple forms of life, up to scores in the higher forms. It may be readily seen by the trained observer, that if the cells of a certain animal contain six chromosomes, and the cells of a human being contain forty-eight, it is simple to determine on this basis the kind of cell under observation.

The difference in the number of chromosomes is not the only difference, nor is it the greatest or most significant. These tiny thread-like particles called chromosomes are the media of inheritance. In the mechanics of reproduction, they play an important part. They contain a chemic material called "cromatin," and this fluid contains, in turn, all the inheritance-tendencies of the past ages of the group to which the individual belongs.

There are two kinds of cells in the body, the somatic, or body cells, and the reproductive cells. The somatic cells may acquire new characteristics, but they have no power to affect the reproductive cells with these new traits. From the very first pair of each kind of living creatures, the tendencies and traits that may be inherited have been passed on in an unknown line of descent, and no acquired characteristic may be inherited. The mechanics of mitosis assure this.

This process of mitosis is the most fascinating phenomenon of modern biological research. There is no field of laboratory study that can compare with this in gripping interest, as the very core of the question of vital reproduction is locked up in this phase of exploration. The understanding of the basic law of Mendelism hinges upon this mitotic proceeding, and, since this article is for the layman and not for the technician, I shall endeavor to make clear in simple language the function and beauty of mitosis.

Among those creatures which begin their individual life history through this method we see that the somatic, or body cell count of chromosomes is always halved in the reproductive cells. The beginning of this process is the union of two reproductive cells through copulation, the male cell, called the spermatozoon, and the female cell, called the ovum. If the body-cells contain twenty chromosomes for instance, then the ova and the spermatozoa will each contain only ten. If the somatic count is ten then the reproductive cells will each have five, and so on through all species. When the ovum and the spermatozoon unite in copulation, they form a union that results in the correct, or somatic number of chromosomes, by the process of simple addition. The purpose in thus halving the count of the parent body-cells is simply that the young of each species may keep this typical number of chromosomes inviolate through the ages.* If this law were not in operation down through the ages then Adam and Eve would have had 48 chromosomes in their somatic count, their children would have had 96, their grandchildren 192, the next generation 348, and in each succeeding generation it would have thus been doubled, until now, in the human family, each cell would have to be of an immense microscopic size to contain the chromosomes alone. The law upon which this process of reduction functions is not yet fully comprehended, but the process is clearly observed.

When the act of conjunction is completed, the spermatozoon approaches the ovum with the object of penetration. We must remember that the spermatozoon is extremely microscopic, and should be classified as a flagellate organism. The greater part of its entire length is a flagellus, or "tail," which is simply the motor apparatus. The apical head of the organism is the real cell. The ceaseless activity of the whipping motion of the flagellus drives the spermatozoon through the protecting endoderm of the ovum, and when penetration is completed the process called mitosis truly begins.

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* For a fuller study see: Embryology and the Recapitulation Theory.

The chromosomes of the ovum contain in their chromatin all the inheritance that has come down thru the female ancestry, while the male chromosomes contain all the inheritance of the male line. The chromosomes of the spermatozoon, released by the absorption of the content of the male cell by the female cell, penetrate to the relative center of the ovum, where they form a conjunction with the female chromosomes. The purpose of this juncture is to mingle the chromatin of the male and female carriers, so that the tendencies of inheritance may be mingled. In the course of this process the chromosomes form what is called the "mitotic pattern." This pattern may be, in some cases, in the form of the letter "X." Where the chromosomes cross there is an opening of their skeletal structure, and the chemic content of the two become thoroughly mixed. Then the two chromosomes break apart at the point of juncture, and resume their normal shape and appearance, **with one vital difference.** The chromosomes now contain neither male nor female chromatin, but a combination of both. So that when the polar bodies form, and the cells of the embryo form from this fertilized ovum, in the cells of the new foetus, there are all the characteristics of the ancestry of both the mother and the father.

All species do not have a mitotic pattern so simple as this, of course, and a volume would have to be written to set forth the knowledge of this process we now possess; this case is given simply by way of illustration. At last, however, we know of the physical basis upon which the fundamental law of procreation works;

that law being "each kind shall produce after its own kind."

The amazing thing is that there is an apprehendable difference in the chromosomes of the various species. Not only in their somatic count, but in the pattern they form while in the process of mitosis. The skeletal structures of these particles differ in the various species, and give a clearly-defined barrier between species that is absolutely **fatal** to the theory of evolution. The chromatin also differs, according to the species under observation.

Another field of cell research is in the substance called "PROTOPLASM." This matter is the very basis of cell structure. Also it is one of the most mysterious substances known in nature. It is the only autocontractile substance so far known; therefore it is the source of all living motion. Muscles move because of the inherent power of protoplasm to expand and contract. The living creatures from amoeba to elephant all owe the power of locomotion to this strange ability of protoplasm to manifest what may best be called elasticity.

It is also the essential element in the continuance of life. To remain alive, every individual, in every order of life, must have constantly-replenished supplies of protoplasm. Thus we arrive at the simplest law of zoological classification, and learn the test for the difference between a plant and an animal. The animals need protoplasm, but they have no power to manufacture it. So they procure their fresh supplies by eating other creatures, either animal or vegetable, and by the process of digestion absorb their protoplasm. The plant has the power to make protoplasm out of the elements. Some in the water, and some in the air, and some by a combination of both, organize the elements they imbibe and produce protoplasm as required. So a plant may be definitely fixed in the vegetable kingdom by this power, and an animal defined by the lack of it.

But whether plant or animal, every living cell is found to contain this essential division, or component. One of the earliest theories of biology, now discarded, was that life was literally resident in protoplasm, if protoplasm was not life itself. This unfailing presence of protoplasm as the basis of all cell life, gave rise to another biological fallacy also—the continuity theory. Briefly stated, the theory of continuity sought to establish a connection between all living things by the presence of protoplasm. This theory was once a mighty handmaiden of the theory of evolution, but is entirely repudiated today.

The continuity expert showed that the amoeba had protoplasm. The rhizapod possessed it, and the euglena, the uvella, the paramoecium, and the rotifer. Each higher organism was found to contain protoplasm, all the way up to man. Thus, said the theorist, the presence of this common substance argues a common ancestor.

This is all changed now. The archaic days of biology are over, and the super-microscope, the micro-manipulator, and ultra-violet observation have opened up new fields. The earliest experiments I know of in the differentiation of protoplasm were to determine the rate of decomposition of this element under the ultra-violet ray. Then sufficient quantities of the substances were isolated for more careful study, and we know now that there is a difference in protoplasm, **by species.** If we may paraphrase a notable statement made some time ago, we can say:

"All protoplasm is not the same protoplasm, but there is one kind of protoplasm of man, another kind of beasts, another of fishes, and another of birds."

Written almost two thousand years ago by **Inspiration,** it is attested as truth today by **observation.** The protoplasm of the cat family is one kind of protoplasm, and the dog family has a distinct type of protoplasm, that differs from that of the cat. Boiled down to its essential summary, there is a variable formula for the formation of protoplasm by species. So we are now in that stage of research where we can begin to test protoplasm as we do blood! We do not make the error of saying, that as all mammals have blood they are essentially the same in origin, because we recognize the appreciable difference in the blood of one species, genus or family, as each kind of blood differs from every other kind. So today with protoplasm; and the continuity theory suffers catastrophic collapse.

While it is not possible, in the scope of such a short paper as this, to complete the case of the collapse of the theory of organic evolution in the science of biology, we must make mention of the remarkable evidence from cytology. There is a science of one small section of the comparatively enormous cell, which division is called the cytoplasm. Small indeed though the microscopic cell may be, when we study its amazingly complex structure, we find ourselves exploring a territory known as the cytoplasm. As important to life as the nucleous, or the protoplasm, or the chromosome, or the centrosome, is this division of cell-structure. There are men whose research is devoted to this one section of the cell alone, and they spend their lives in the study of this apparently restricted field. The restriction is only apparent, however, as there is much more territory still to be conquered in cytology, even after these many years. This, in spite of the amazing and illuminating discoveries that have already been made.

Let us consider, as an instance, the strange and bewildering organism, or organization, known as the Apparatus Golgi. The "apparatus" may be an organization, either reflex or vital; no man can yet say. In the restricted and minute portion of the cell now under consideration, we find a tiny mass of ceaseless fluctuation, having no better name for it, we call it after its discoverer, and there we must for awhile, rest content. But while nothing is as yet known about its structure, much has been learned about its conduct. One individual is found in each of the myriads of cells that form the complete morphological structure we name the body. Within the border of the cytoplasm this speck is in ceaseless and constant fluctuation, and this motion never ceases while life is in the cell. What the purpose of this motion may be, and whether we are here facing the final mystery of the "reason" of biological vitality, are at present subjects for speculation and research; but the fact of fluctuation is established.

The wonder of the whole process is the bewildering patterns of fluctuation the "Apparatus Golgi" seems capable of attaining. In one species it completes its cycle of motion in the pattern of an old-fashioned hour glass, in another in the form of a right hand figure eight, in yet another the form of the motion is a diamond, a parallelogram, or some geometric design is reproduced, seen elsewhere in nature only in the vast field of the rhizapod. There are apparently as many plans of completing the cycle of motion as there are variegated species!

This plan is somatic to the species the Apparatus inhabits. Recent observation has shown that when there is a threatened carcinoma, the Apparatus Golgi is subject to a change or derangement of pattern in that one organ where the cancer is forming; so in a short while a technique of observation may be developed that will warn in time of the approach of this dreaded foe of man. Indeed, if the present knowledge of the Golgi apparatus is applied, that warning may even now be observed.

By the use of a modified osmic acid technique, the Golgi bodies may be separated from the cytoplasm and in isolation studied and dissected. This opens up the hope that we may soon possess greater knowledge of this mysterious structure which is resident within our cells. But even while we wait for that greater knowledge, we have Golgi wisdom enough to assure us of the vast difference between the cells of one species and those of another, and its findings, fatal to the theories of organic evolution, are unanswerable.

Even more complete is the demolition of old ideas made manifest by the research of Mayagawa. Never again can the well-informed student say there is identity of structure in all cells; there is a vital difference even in the cells of the different organs in the same individual! Not only do cells differ by species, but certain elements are in certain cells, for certain organs, **and those cells will not function in or for any other organ.**

Like all other living things, cells die. In the human body the longest life of a cell is twenty-one days; the shortest, seven. When we consider that the human body is made up of approximately twenty-six (American) trillion cells, and all these must be replaced at least once in every three weeks, we can see that there is a tremendous rate of cell replacement going on constantly. This continuous change also raises the problem of the disposal of this vast number of cell "corpses." What becomes of the dead cells?

The work of the gifted Japanese scientist above mentioned showed that when the dead cells entered the blood stream, they made the complete circuit of the system, **and returned to the organ which produced them.** Here they were broken up into their component elements, and used as the basis in the creation of new cells for that organ. When the dead liver-cells enter the blood stream, they invariable make a "round trip" and enter the liver again. The kidney will not have anything to do with them, nor will the lungs, the heart, the stomach, or any other organ in the body. They belong to the liver exclusively, and every other organ recognizes the trade mark of the liver, (or it may be the parentage), and pursues a "hands off" policy that is rigidly respected. Even when the cells of the liver are, by force, injected into some other organ, that organ expels them into the blood stream again, and they return to the parent organ as quickly as possible. There is a distinction which is never violated. The same is true of every other organ in the body. We use the liver only by way of example. The liver will not take the cells of any other organ, any more than any other organ will take the cells of the liver. The epithilial cells are never accepted by the heart, the heart cells are never accepted by the lungs, the cells of the blood are used by no other organ, not even in the same body.

There is a splendid field for therapeutic research here, as it is already known that a subnormal organ may be speedily brought back to normal by an injection of the dead cells of that organ. Care must be exercised in this procedure, as too heavy a load will result in production of necrotic tissue, and the latter end is then worse than the former.

The farmer is familiar with this newly discovered principle, as he is used to the process of putting back into the soil the elements his crop has taken out of that soil. So, in like manner, all the elements of a dead cell may be said to "fertilize" the organ that produced it, and none of the ingredients of that cell are ever used by any other organ than the producing organ. With one outstanding exception, the red cells of the blood, when they are broken up to make new cells in the process of regeneration, contribute their hematin for the formation of bile pigment, and so the vital blood cells lose an infinitesimal portion of their substance every time they die and are born again. Since "the life of the flesh is in the blood thereof," and since it is the blood-cell alone that loses in the process of recreation, the mystery of senility and inevitable death may well lie in this factor.

The main entrancing factor about our present biological knowledge, is our woeful ignorance; but we are at least on the borderland of true understanding, and such research as this opens up new vistas for study. But we cannot enter a new day encumbered with ancient ignorance and burdened down with the fallacies of past generations. If we live in a scientific age, let us conduct ourselves with scientific intelligence, and cast aside the old falsehoods as fast as they are proved to be such.

This is an extremely difficult thing to do, and instead of grasping a new fact as opportunity for a fresh beginning in additional research, many men of the old school will seek to repudiate new truth for the sake of clinging fast to old theories. To this extent the theory of organic evolution is a sad handicap to true scientific research, as there is a regrettable tendency on the part of many men of that school to minimize and hush up new discovery of scientific fact, because of its repudiation of their pet philosophy. Science and philosophy must sue for divorce before the court of true research, in order that the search for truth, called science, may no longer be forced to drag around the old hag of erroneous theory. **There are scientific "obscurantists,"** as well as religious ones!

Even recognizing the fact of our present ignorance, and perhaps being unable to see very far as we gaze into the brightness of the blazing horizon of the new day, we can at least accept those things that have been proved—chief of which is that the science of biology has demonstrated the error of relationship through common ancestry of all living things. By the multiplied evidences that prove the unbridgeable gap between various kinds of cells, establishing the foundational reason for the phenomenon of the fixity of species, we can say we are in a new day of biology. The problem now is to bring the scientific world to an apprehension of this new day, that we may have a new interpretation of biology in harmony with what we now know to be true. Certainly, even if the new interpretation is delayed in its coming, we can press on past the old and erroneous conclusion of the school of evolution, and **hold fast to the only other present alternative, the old, but newly established fact of special creation.** Only this explanation of the marvelous fact of cell-specialization really fits all the evidences, without distorting those evidences out of their true form. For every fact and proof that mitigates against the truth of the theory of organic evolution is a tremendous argument in favor of the fact of special creation. So that once more we can exclaim: "Let us hold fast that which has been committed to our care, repudiating the profane babblings of a science that is falsely so called."

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